(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: 0 081 184
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: 82111050.9

(22) Date of filing: 30.11.82

(51) Int. Cl.³: G 11 B 7/00
G 11 B 7/08

(30) Priority: 04.12.81 US 327321

(43) Date of publication of application: 15.06.83 Bulletin 83/24

(84) Designated Contracting States: AT BE CH DE FR GB IT LI LU NL SE

(71) Applicant: DISCOVISION ASSOCIATES
3300 Hyland Avenue
Costa Mesa California 92626(US)

(72) Inventor: Giddings, Gary M.
25062 Linda Vista
Laguna Hills California 92653(US)

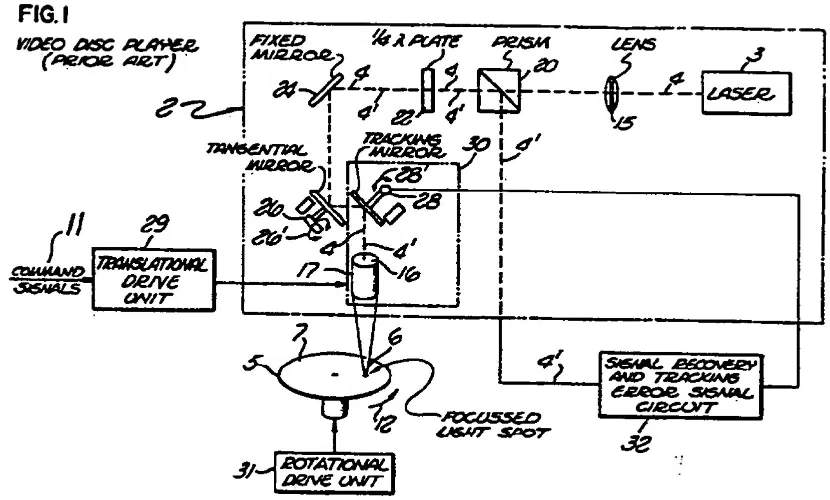
(74) Representative: Fleuchaus, Leo, Dipl.-Ing. et al,
Fleuchaus & Wehser Melchiorstrasse 42
D-8000 München 71(DE)

(54) **Banded and interleaved videodisc format.**

(57) An information storage carrier for storing intelligence information along a path on the medium extending from an upstream location to a downstream location. The carrier is comprised of an information storage member having a surface upon which the information is stored. A first series of lineal regions are arranged on the surface, each region of such first series of regions containing information representative of a portion of the total information stored in the first series regions. A second series of lineal regions is arranged on the surface, spaced from the first series of lineal regions, each region of the second series of regions containing information representative of same portion of the information stored in a corresponding region of the first series of lineal regions, thereby providing duplication of the information at two locations on the storage member. Additional series of lineal regions can be arranged on the surface, thereby providing additional duplicated information locations on the storage member, the additional number of series of lineal regions depending upon the length of the program contained in each series and the total available time on the storage medium.

FIG. 1

VIDEO DISC PLAYER
(PRIOR ART)



BANDED AND INTERLEAVED VIDEODISC FORMAT

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a videodisc containing prerecorded intelligence information in the form of a series of television picture frames with each series of frames being duplicated on the surface of the carrier at at least two locations.

Prior art videodisc structures bear information in the form of concentric circles or a spiral track extending from an upstream start position to a downstream end position. The disc is played by causing a read head to progress along the path from the upstream to downstream positions and to play out a complete program as it progresses from start to finish.

Upon playing back the prerecorded program, the read head of the player can encounter defects or blemishes on the surface of the disc, thereby destroying the synchronization and/or color registration or causing picture loss often accompanied by a noisy (snowy) interval. The defect or blemish on the disc could be the result of imperfect manufacturing processes or caused by mishandling of the disc by the user. Moreover, a scratch or dust particle in a disc stamper, for example, could cause the same defect in each disc produced by that machine. Thus, not even the employment of a number of redundant players loaded with similar discs could serve to eliminate signal loss at such a defect location. The present invention, on the other hand, both eliminates the need for redundant players and eliminates the effects of systematic production irregularities, since the redundancy of information lies in different portions of the disc.

SUMMARY OF THE INVENTION

An information storage carrier is described having a storage member for storing intelligence information along a path on the member extending from an upstream location to a downstream location. A first series of lineal regions is arranged on the surface, each region of the first series of regions containing information representative of a portion of the information stored in the first series of regions. A second series of lineal regions is arranged on the surface and spaced from the first series of lineal regions, each region of the second series of regions containing information representative of the same portion of the information stored in a corresponding region of the first series of lineal regions, thereby providing duplication of the information at two locations on the storage member.

In reading a videodisc, a player causes the disc to rotate typically at 1800 rpm beneath a read head which focuses a laser light beam onto the disc. As the disc rotates, the light beam is reflected or not from the surface depending upon whether a planar portion between a series of bumps or a bump is encountered by the light beam as it impinges the disc surface. As a result, the constant collimated light beam impinging upon the surface of a disc is reflected from the disc surface in the form of an interrupted reflected beam of light which can be sensed by a photodetector, amplified, and observed and listened to on a standard television monitor or comparable equipment.

Since the bumps are arranged in track-like fashion along a substantially circular path on the disc surface, proper translational drive mechanisms and tracking mirror arrangements can be provided to keep the light beam focused on the track in spite of certain small defects in the disc surface or of deviations caused by eccentricity of the tracks relative to the axial center line of the spindle rotating the disc. By adapting the translational drive mechanisms and the tracking mirror arrangements to respond to control signals, a player can be programmed to search for a predetermined position on the disc, and it is relatively common for a player to search for a specific single track which is identified by a frame number encoded in the information prerecorded on each track. Accordingly, and if so instructed, a player can search for, locate, and playout a single track of information from among some 54,000 tracks of a modern laser-recorded video disc. After acquisition of the selected track, the player can replay that track repeatedly (i.e., still frame the track) or it can use the selected track as the start point from which it and subsequent tracks are read out.

With the present day technology capable of recording 54,000 tracks on one (or each) side of a video disc, a full half hour of program material can be recorded in standard NTSC format, that is when a single picture frame occupies a complete revolution of the disc, i.e. using a constant angular velocity (CAV) mode of recording. In the constant linear velocity (CLV) mode

of recording, upon playback the same size videodisc can carry programs up to 1 hour in length. The present invention takes advantage of the high information density of a videodisc, either in the constant angular velocity mode or in the constant linear velocity mode to add a degree of playback fidelity heretofore unknown.

Basically, the present invention involves the recording of programs which are relatively short as compared with the available length of time that can be recorded on a video disc. In carrying out the invention, the program is recorded at more than one location (first version) on the disc surface, thereby permitting the player to index to the first program information location on the disc, and if the information retrieved at that location is not of appropriate quality, the player automatically searches for, locates, and plays the next repeated program version. This process would also result in the event that the frame searched for upon initial starting up of the player was not found due to a defect or blemish in the record suface. In such a case, the player will automatically search for the same frame number originally searched for incremented by a fixed frame count, such as 10,000.

An appreciation of the improved yield as a result of duplicating programs on a videodisc can be seen in the following examples. Yield analyses have been performed on discs exiting a production line and have shown that 1 bad track in every 100 (i.e., $\frac{1}{100}$ defects ratio) represents a relatively bad yield; $\frac{1}{1000}$ represents a medium good yield; and $\frac{1}{10000}$ represents an excellent yield. Assuming that the program to be recorded is short enough to be recorded on the disc twice, and assuming that the spacing between like program segments on the disc is sufficient to avoid the possibility of a defect spanning such like program segments, the overall yield of the disc is equal to the product of the yield ratios for the two like programs. Since both programs are located on the same disc, this analysis results in an equivalent yield ratio equal to the square of the yield ratio if only one program version were recorded. If the basic yield ratio for a given disc were $\frac{1}{100}$, repeating the program once would produce an equivalent yield ratio of $(\frac{1}{100})\ (\frac{1}{100}) = \frac{1}{10000}$, thus rendering the otherwise "bad yield" disc an "excellent yield" disc.

Needless to say that the yield ratio improvement by this method is orders of magnitude greater than that obtained by implementing tedious, expensive, and complex manufacturing process optimization techniques. Furthermore, for programs of a length to permit duplication of the program twice (resulting in a total of three program versions on the disc), even a "bad yield" disc would have an equivalent yield ratio of $(\frac{1}{100})(\frac{1}{100})(\frac{1}{100}) = \frac{1}{1\text{ M}}$. Since a disc has typically 54,000 tracks on one side, the latter example indicates that $\frac{\text{1 defective track}}{\text{1M tracks}} \times \frac{\text{54,000 tracks}}{\text{Disc side}} = .054$ defective tracks per disc side would result, and this is an extremely good figure even for a disc containing all still frame information. Another way to state the latter given figure is $\frac{1}{.054} = 18.5$ discs per defective track, or the chances are that one defective track would occur, on the average, for every 18.5 single sided discs.

The present invention can be implemented by arranging a program in a series of spaced bands on the disc surface, with the beginning frame number of each

band being incremented by the number of tracks separating the beginning of one band from the beginning of the next band. That is, in the CAV mode, a 15 minute program can be repeated twice on a single side of the disc, and the fixed increment of frame numbers between like program parts is in the vicinity of 27,000 frames or tracks. Similarly, for a 10 minute program, the program material can be duplicated two additional times (i.e., repeated three times) on the disc surface, and the fixed increment is 18,000 frames. A similar analysis can be made for the CLV mode of operation where, for example, a 15 min. program can be duplicated three additional times (i.e., repeated four times), and the frame increment between bands is 13,500.

It should be noted that the term "program" in the above and following discussions can refer to a continuous "movie-type" program in which each successive frame along a spiral track contains a different sequential picture of the movie sequence, or it can refer to a plurality of still frames arranged in concentric circles and which, taken as a group, constitute a "program" of video material, each with accompanying sound.

Further, it can be appreciated that the program to be recorded may have subprogram parts that are vitally important and other parts that are relatively

unimportant. For example, if part of a program were in a movie format showing actors and sets only and part were in still frame showing details of a table or chart of information, drop outs due to defects in the movie portion are not nearly as vital as those in the still frame portion. Accordingly, the still frame part could be termed a subprogram, and only this subprogram could be repeated at another location on the disc. Other examples of subprogramming for duplication are obvious and need not be discussed here.

In a preferred embodiment of the invention, the information storage carrier contains a pair of program areas on the disc, each program area comprising a

series of lineal regions arranged such that each region of one of the series of regions contains information representative of a portion of the program stored in the complete series. The second and further series of lineal regions are arranged on the disc surface spaced from the first series of lineal regions and from one another such that each region of each other series of regions contains information representative of the same portion of the information stored in a corresponding region of the first series of lineal regions.

Preferably, a video program is recorded in annular banded areas on the disc in the form of a plurality of concentric circles, or in a spiral extending from an upstream to a downstream position with each spiral occupying a substantially circular track on the disc surface. The program is then repeated in its entirety in a second annular band spaced from the first band. Depending upon the length of the program and the length of available time on the disc surface, the program is repeated a whole number of times equal to Available Time ÷ Program Length.

In a further embodiment, the program material is repeated in interleaved fashion on the disc surface. That is, a segment of the first version of the program is recorded at an upstream location on the disc, and the similar segment from the second version of the program is recorded at the next downstream location, and similarly for the first segments of the remaining program versions.

Following the last of the "first segments", that is from the last program version, the second segment from the first program version is recorded followed by the similar second segment from the second program version, and so on until all segments of all versions are recorded.

By this interleaving of programs, identical segments of programming lie adjacent to one another, and, as before, the number of times the program is repeated, i.e., the number of identical adjacent tracks is found by dividing the total available recording time for the surface of the disc by the length of the program to be repeated. While this method of encoding a disc does not avoid large surface defects or blemishes, it does provide duplicate programs for the player to search in the event that a small blemish or defect would be encountered upon playback of the first program, and this form of interleaved programming is especially useful when the search time between sensing a defect in one program and making acquisition of the next program is required to be as short as possible. Thus, in the interleaved embodiment of the invention, a sensed defect in one program would be cured by substituting the program on an adjacent track, and the longer search time required of the banded embodiment previously described can be avoided.

As with the earlier described banded configuration, the interleaved configuration can accommodate both concentric circular segments or a spiral configuration for the program material.

BRIEF DESCRIPTION OF THE FIGURES

Figure 1 is a block diagram of a prior art videodisc player showing the relationship of the videodisc with the remainder of the electronics and mechanisms used in the player;

Figure 2 is a plan view of a videodisc containing two bands of program material recorded thereon in a "concentric circles" format;

Figure 3 is a plan view of a videodisc showing five bands of a program recorded thereon in a "concentric circles" format;

Figure 4 is a plan view of a videodisc encoded in "concentric circles" format with interleaved video program information in accordance with an alternate embodiment of the invention;

Figure 5 is a partial enlarged view of a portion of the videodisc shown in Figure 4;

Figure 6 is a plan view of a videodisc structure encoded with bands of programming material with each program arranged in spiral fashion on the disc surface; and

Figure 7 is a plan view of a videodisc structure with interleaved programs in the form of spiral tracks around the disc surface.

DETAILED DESCRIPTION OF THE SHOWN EMBODIMENTS

The same numeral is used in the several views to represent the same element.

Referring to Figure 1, there is shown a schematic block diagram of an optical system 2 employed in a typical prior art video disc player system. The optical system 2 includes a read laser 3 employed for generating a read beam 4 which is used for reading a frequency modulated encoded signal stored on a video disc 5. The read beam 4 is polarized in a predetermined direction. The read beam 4 is directed to the video disc 5 by the

remaining members of the optical system 2. The videodisc 5 is read by imaging the light beam 4 to a spot 6 at its point of impingement with the videodisc 5.

The counterclockwise direction of rotation of the disc 5 relative to read beam 4 is indicated by the arrow 12.

The optical system 2 further comprises a lens 15 employed for shaping the beam 4 to fully fill an entrance aperture 16 of a microscopic objective lens 17. The objective lens is employed for forming the spot 6 of light at the point of impingement with the information track 9.

After the beam 4 is properly formed by the lens 15, it passes through a beam splitting prism 20. The transmitted portion of the beam 4 is applied through a quarterwave plate 22 which provides a forty-five degree shift in polarization of the incident light forming the beam 4. The read beam 4 next impinges upon a fixed mirror 24 which redirects the read beam 4 to a first articulated mirror 26 rotatable in the directions of double headed arrow 26'. The function of the first articulated mirror 26 is to move the light beam in a first degree of motion which is tangential to the surface 7 of the video disc 5 to correct for time base errors introduced into the reading beam 4 because of eccentricities in the player or in the manufacture of the disc 5. The tangential direction is in the forward and/or backward direction along the informtion track on the video disc 5.

The first articulated mirror 26 directs the light beam to a second articulated mirror 28. The second articulated mirror 28 is rotatable in the directions of double headed arrow 28' and is employed as a radial tracking mirror. It is the function of the tracking mirror 28 to respond to a composite tracking error

signal by slightly changing its physical position with relationship to the read beam 4 to control the point of impingement 6 of the read beam for radially tracking the information track. The second articulated mirror 28 has one degree of movement which moves the light beam back and forth in a radial direction over the surface of the disc 5.

At various playing modes of the player, it is necessary to translate the read head distances, or at rates, too great for the tracking mirror 29 to accommodate. Thus, for initial start-up and during the execution of search commands on line 11, a translational drive unit 29 is provided. By mechanical or other equivalent means, and under servo control, translational drive unit 29 effects coarse translational movements for the objective lens 17 and thus for the light beam 4. However, in order to reduce the mass needed to be moved in order to effectuate such translational movement of the read head and to consequently be more responsive to feedback servo control signals, tracking mirror 28 and object lens 17 are positioned on a movable carriage 30. Carriage 30 is movable by translational drive unit 29 only along the axis of the light beam 4 leaving tangential mirror 26. Upon receiving command signals from an operator keyboard or internal control unit (not shown), translational drive unit 29 moves carriage 30 to the desired location on disc surface 7. A rotational drive unit 31 is shown schematically for providing rotational drive energy to the disc 5.

In the normal playing mode, the reflected beam identified at 4' is a modulated light beam. The modulated reflected beam 4' is a light equivalent of the frequency modulated signal represented by the specular light reflective and non-specular light reflective members (not shown) positioned in the information track. The modulated light beam from the disc 5 is gathered by the microscopic objective lens 17 as it is reflected

from the successively positioned members 10 and 11. The reflected read beam 4' retraces a portion of the same path previously described for the impinging read beam 4. This path includes sequential reflection from the second articulated tracking mirror 28, the first articulated tangential mirror 26, and the fixed mirror 24. This common path in the read optical system 2 is identified by numeral 4 for the incident light beam and numeral 4' for the reflected beam. The reflected read beam 4' next passes through the quarterwave plate 22. The quarterwave plate 22 provides an additional forty-five degree polarization shift resulting in a total of ninety degree shift in polarization of the reflected read beam 4' with respect to the incident read beam 4. The reflected read beam 4' now impinges upon the beam splitting prism 20 which diverts the ninety degree phase shifted reflected read beam 4' to impinge upon a signal recovery and tracking error signal circuit indicated generally at 32. The circuit 32 generates the radial tracking error signal identified hereinafter.

In the remaining figures, the invention is described having reference to embodiments in the form of disc-shaped information storage carriers, and in particular to video discs containing programs of recorded material which are relatively short as compared with the available length of time that can be recorded on the video

disc. The information recorded on the recording medium can be repeated to provide duplication of the program information at two or more locations on the storage member.

In Figure 2, a banded video disc structure is shown containing two bands of program material recorded in a "concentric circle" format. Assuming that the disc is read from inside-to-outside, a first band 33 of the program (first version) is shown to have an upstream beginning location 34 and a downstream end location 35, while the second band 36 of program information (second version) has an upstream beginning location 37 and a downstream end location 38.

In the implementing of this invention, it is necessary for the player with which the disc is used to be able to search the disc to locate specific frames of the recorded program. With the disc turning at 1800 RPM, a complete program picture, displayed on a monitor in two 60 Hz fields, would occupy one complete concentric circle of the band of recorded information. Recorded in the NTSC format, a wedge of recorded information representing the vertical interval between fields would appear as shown by numeral 39 in the figures.

An annular guard band 40, 40a, and 40b is shown in the figures between program versions, although this blank area between repeated program versions is primarily for use of illustrating the invention in the figures, and a practical realization of the invention

would result in a series of continuous concentric circles spanning the guard band 40, but the first frame of the second program of information would not begin until the initial concentric circle 37 of the second program band 36.

For illustrative purposes, and recognizing that one side of a video disc can contain as many as 54,000 concentric circular paths, it will be assumed that track 37 is spaced from track 34 by 10,000 track numbers. In the examples of the invention to be discussed, and recognizing the desirability to conform to NTSC standards, each concentric circle, referred to hereinafter synonymously with "track", contains a single frame of video and audio information.

In the still frame or CAV mode, a user can instruct the machine playing the disc of Figure 2, via a pushbutton control panel or similar device, to locate and playout a particular frame number. In the present example, it may be assumed that frame number 268, illustrated by reference numeral 41 in Figure 2, is to be played out. The disc player, upon receiving the instruction to locate frame number 268 scans across the disc in a downsteam direction to locate the desired frame, preferably by means of recognizing a recorded time code associated with each frame. Upon finding the desired frame, the player automatically engages in a play mode, and the selected frame is displayed in "still frame" fashion. As dicussed earlier, in the event that, upon searching for such a frame number, the

frame number is not located, or the video signal is not within acceptable tolerance limits at that location, the frame number is incremented, by say 10,000 frames, and the player searches for and plays out frame number 10,268 illustrated in Figure 2 with reference numeral 42.

If the program of each band of information is of such a length that it can be repeated every 10,000 frames (also every 10,000 tracks), the program can be repeated on a disc of 54,000 tracks five times, so that upon the occassion of a very large blemish, defect, or other imperfection in the disc surface spanning two or more bands of repeated program material, the player can jump ahead to frame numbers 20,268, 30,268 or 40,268. Such a five band video disc structure is shown in Figure 3 wherein the duplicated bands of program are shown at 43 through 47.

Figure 4 shows a second preferred embodiment of the invention in which the program material is repeated in interleaved fashion on the disc surface. A first version of the program is recorded beginning at an upstream location 34a and ending at a downstream location 35a shown as the second to last track in Figure 4. A second version of the program is recorded beginning on track 37a spaced downstream one track from the beginning track 34a of the first version of the program and extends to a downstream ending track 38a which is spaced downstream one track from the ending track 35a of the first program version. The recording

format of the program in Figure 4 is, like as in Figures 2 and 3, in the form of a plurality of concentric circles. Clearly, a spiraling form of tracks for each program is equally implemented by repeating the program for as many times as is limited by the disc surface area (See Figure 7 and accompanying description). Likewise, it will be appreciated that in the embodiment of Figure 4, each concentric circle of the first program version represents a complete frame of video information and is followed in the downstream direction by an identical frame of information of the second version of the program. For shorter programs, more than two repetitions of the program material can be recorded on the same disc side, and using the previous example of a program of 10,000 frames in length, the first five tracks of the disc will be repeated versions of the first frame of the program, the next five tracks will be repeated frames of the second frame of the program material, and similarly for the remaining groups of five tracks until the end frame of the last program version.

Figure 5 is an enlarged view of the inner tracks of Figure 4 illustrating the five program verison embodiment of the invention just described. As can be appreciated by reference to Figure 5, the first five tracks are all identical in information content and represent, respectively, the first frame of each program version repeated five times. The sixth downstream track is thus the second frame of the first program version, the seventh track is the second frame of the

second program version, etc. For ease of undstanding, the tracks shown in Figure 5 are labeled with the number following the letter "F" representing the frame number, and the number following the letter "P" representing the program version.

The embodiments shown in Figures 2 and 3 represent preferred forms of the invention in which a video program is recorded in annular banded areas on the disc, each banded area comprising in a plurality of concentric circles. Even the interleaved embodiments of Figures 4 and 5 have been described with the information recorded thereon in "concentric circles" format. Since present day video disc players are capable of still framing from a spiraling track of video program information, each of the repeated programs on the banded video disc structure can, in an alternative embodiment that described above with reference to Figures 2 and 3, comprise a spiral track extending from an upstream to a downstream position with each spiral occupying a substantially circular track on the disc surface.

Figure 6 is a plan view of a video disc structure in which the information is recorded in the form of spiral tracks around the disc surface. Figure 6, in particular, shows the disc encoded with bands of programming material with each program version arranged in spiral fashion and separated from the adjacent program version by an anular guard band 40. As with the earlier embodiments, the spiral from beginning to

end of the disc shown in Figure 6 can be continuous with only the program material segregated in annular bands. For comparison purposes, like reference numerals are used for the beginning and ending tracks of each program band and for the annular guard band 40b as was used in Figure 2. Other than having the program recorded in spiral format in Figure 6, there are no physical or functional differences in the manner in which the invention is implemented by this alternative recording technique.

Turning now to Figure 7, there is illustrated a spiral version of the interleaved embodiment of Figure 4. As before, reference numerals in Figure 7 correspond to like reference numerals in Figure 4, the only difference between the two embodiments in these two figures being that Figure 7 uses a spiral format for the track arrangement, while Figure 4 uses a concentric circles format. As with the Figure 4 arrangement, subject to availability of disc surface area, a plurality of interleaved spiral tracks can be recorded on the same disc surface.

Thus there has been shown and described an information storage carrier upon which a program is repeated in either banded or interleaved configuration on the disc surface, thereby providing duplication of the information at two or more locations on the storage member. As a result, a higher yield of usable prerecorded units is realized, since any blemishes or defects in the surface of the storage member containing

the information will, in all probability, be localized to such an extent that the player playing back the storage member can search for and play out the same information from a different location on the storage member that is void of the blemish or defect.

While the invention has been particularly shown and described with reference to preferred embodiments thereof, it will be understood by those skilled in the art that changes in form and details may be made therein without departing from the spirit and scope of the invention. For example, in the embodiments shown and described herein, the terms "program", "bands", and "tracks" can be taken to their physical dimensional extremes without excluding the basic concepts underlying the invention. Each "program" can, in the extreme case, constitute a single track, or even partial track, thus occupying a single or partial circular segment or track on the disc. Likewise, a "band" can comprise a single circular or spiral track. Finally, a "track" can constitute an arcurate portion of a concentric circular or spiral segment. In Figure 6, the most inwardly located track can contain the first frame of the first program version, the next downstream track (continuous from the first) can contain the first frame of the second program version and so on, consistent with the program repeat limits discussed earlier as to available area and program length.

CLAIMS

1. An information storage carrier for storing intelligence information along a path on said carrier, said carrier comprising: an information storage member having a surface upon which said information is stored; a first series of lineal regions arranged on said surface and defining a program of information, each region of said first series of regions containing information representative of a portion of said program information; and a second series of lineal regions arranged on said surface and spaced from said first series of lineal regions, each region of said second series of regions containing information representative of the same respective portion of the information stored in a corresponding region of said first series of lineal regions, thereby providing duplication of said program information at two locations on said storage member.

2. The information storage carrier as claimed in Claim 1, comprising: N additional series of lineal regions arranged on said surface, each of said N series of lineal regions spaced from adjacent series of lineal regions, each region of each of said N series of regions containing information representative of the same respective portion of the information stored in corresponding regions of said first and second series of lineal regions, thereby providing duplication of said program information at N locations on said storage member.

3. The information storage carrier as claimed in Claim 1, wherein: the regions of said first series of lineal regions are arranged continuously and contiguously along said path from a program-start upstream location to a program-end downstream location, thereby defining a first program information band on said storage member between said start and said end locations; and the regions of said second series of lineal regions are arranged continuously and contiguously along said path to define a second program information band on said storage member between corresponding program-start and program-end locations, said second program information band being spaced downstream from said first program information band.

4. The information storage carrier as claimed in Claim 1, wherein: the regions of said first series of lineal regions are arranged interleaved with the regions of said second series of lineal regions along said path to define alternate first and second regions spaced along said path.

5. The information storage carrier as claimed in Claim 3, wherein: said storage member is disc-shaped; said path comprises a plurality of concentric substantially circular segments; said first information band extends from a first radial distance to a second radial distance from the center of said storage medium; and said second information band extends from a third radial distance to a fourth radial distance from the center of said storage medium.

6. The information storage carrier as claimed in Claim 5, wherein: said first radial distance is less than said second radial distance; said second radial distance is less than said third radial distance; and said third radial distance is less than said fourth radial distance.

7. The information storage carrier as claimed in Claim 4, wherein: said storage member is disc-shaped; and said regions of said first and second series of lineal regions are arranged in alternating concentric, substantially circular segments.

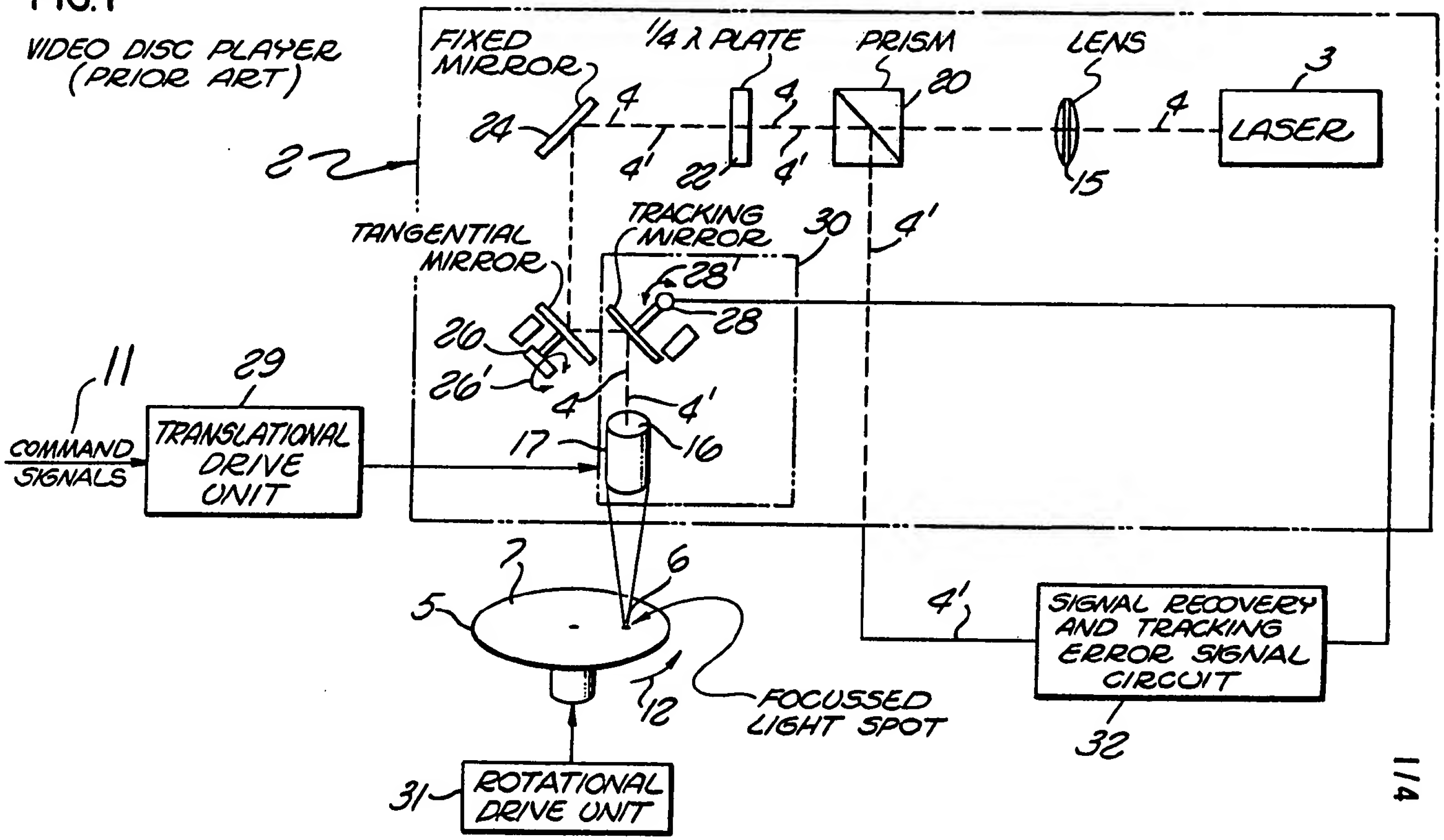
8. The information storage carrier as claimed in Claim 1, wherein: said storage member is disc-shaped; and each region said first and second series of lineal regions is substantially circular in shape and contains all the video and associated audio information necessary to represent a complete picture frame of a television signal.

9. The information storage carrier as claimed in Claim 2, wherein: said storage member is disc-shaped; N is greater than two; and said regions of said first, second, and N series of lineal regions are arranged with the first region of each series cascaded in the order of first through Nth in radially progressing concentric circular segments, followed by the next region in order from each series cascaded in the order of first through Nth, the last region of each series also cascaded in the order of first through Nth.

10. The information storage carrier as claimed in Claim 2, wherein: said storage member is disc-shaped; N is greater than two; the regions of said first series of lineal regions are arranged continuously and contiguously along said path, thereby defining a first program information band on said storage member; and the regions of said second through Nth series of lineal regions are similarly arranged continuously and contiguously along said path, thereby defining, respectively, second through Nth program information bands.

FIG. I

VIDEO DISC PLAYER (PRIOR ART)



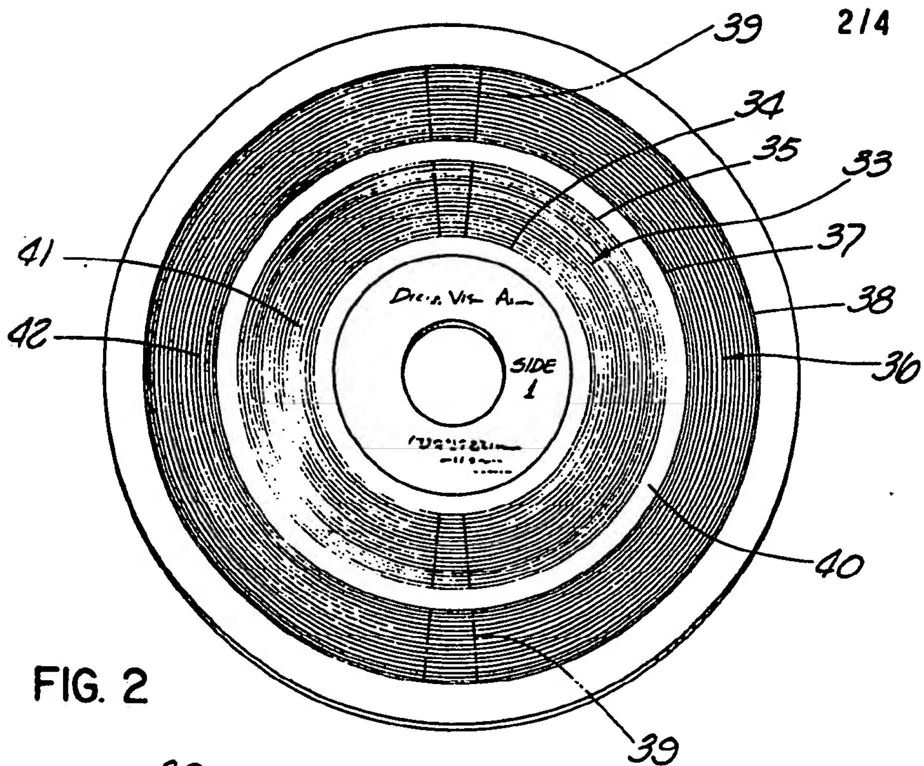


FIG. 2

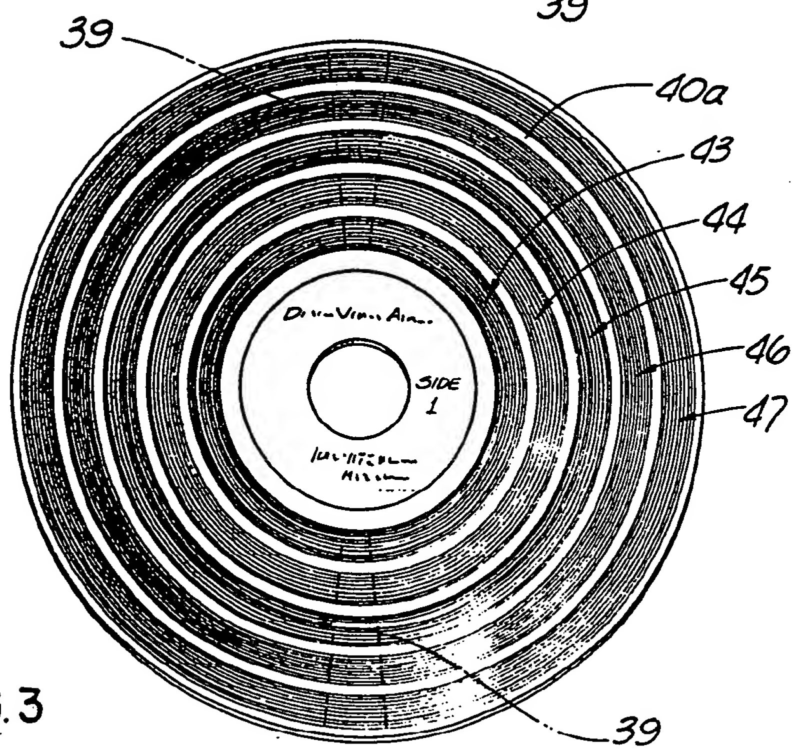


FIG. 3

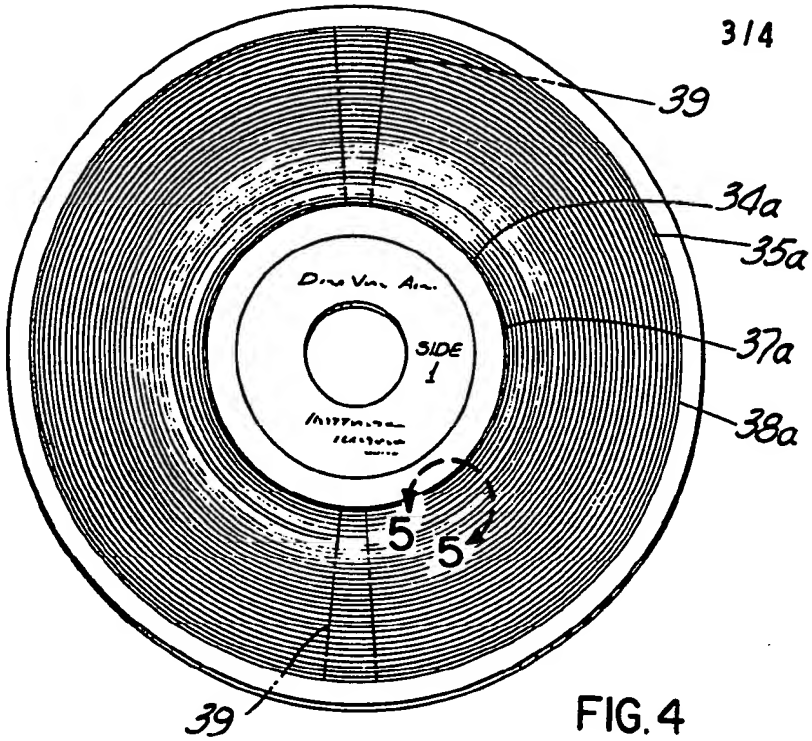

39
34a
35a
37a
38a
SIDE 1
5
5
39

FIG. 4

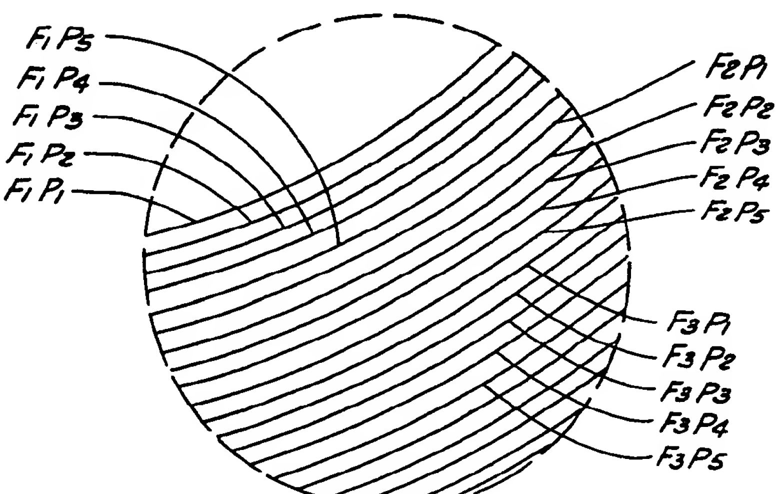

F1 P5
F1 P4
F1 P3
F1 P2
F1 P1
F2 P1
F2 P2
F2 P3
F2 P4
F2 P5
F3 P1
F3 P2
F3 P3
F3 P4
F3 P5

FIG.5

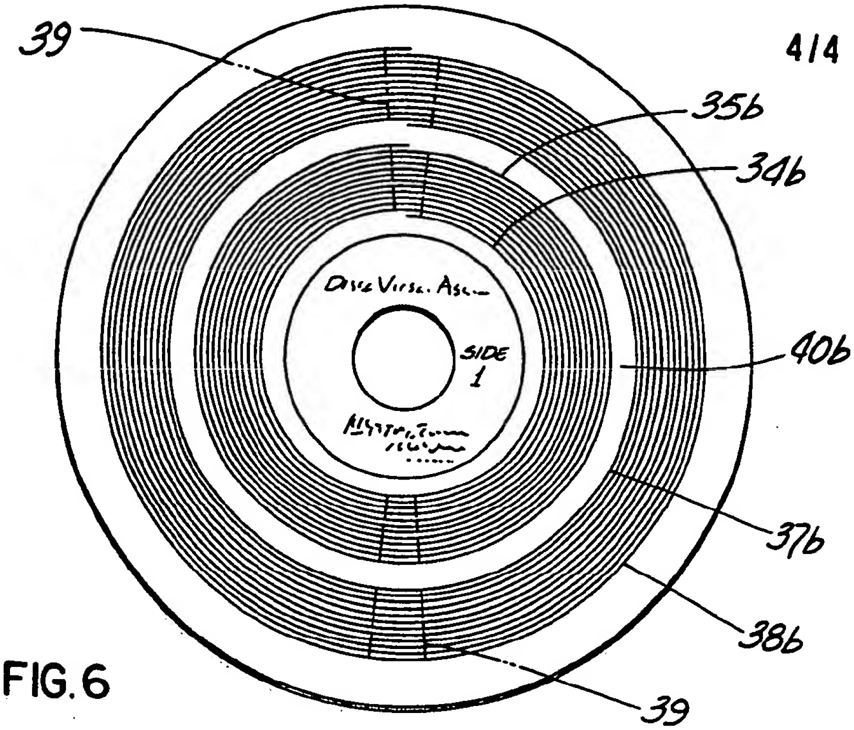


FIG. 6

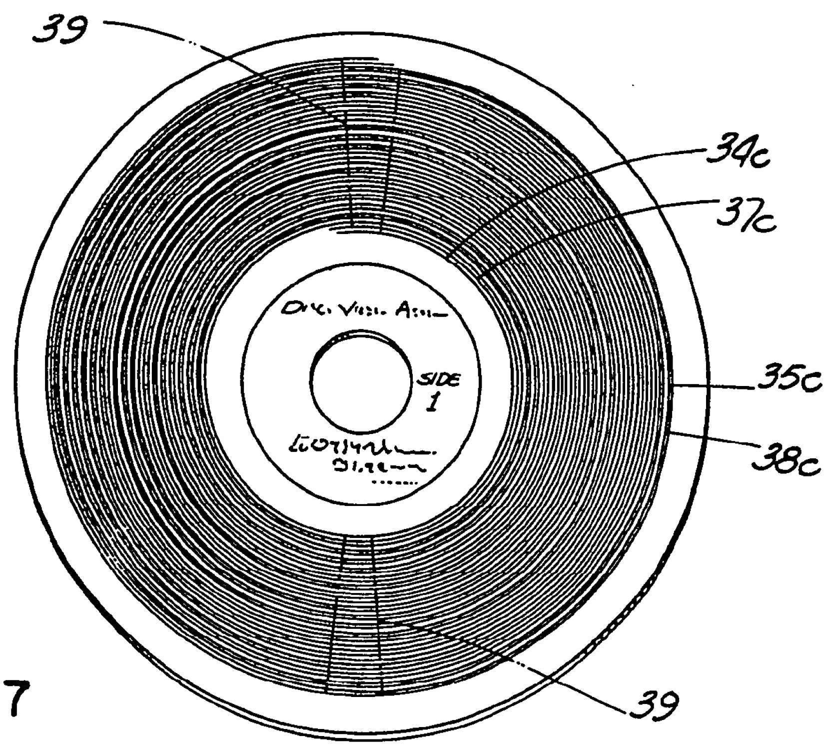


FIG. 7